



Meeting Date: June 9, 2015

STAFF REPORT

Agency: City of Belmont
Staff Contact: Leticia Alvarez, Public Works Department, 650-595-7469, lalvarez@belmont.gov
Agenda Title: Informational Report on Street Pavement Condition
Agenda Action: No Action Required

Recommendation

This is an informational report. No action is required.

Background

The City is responsible for the operation, repair and maintenance of approximately 70 centerline miles (140 travel lane miles) of streets with a pavement replacement value of over \$102.2 million in present day dollars.

The Metropolitan Transportation Commission (MTC) requires local agencies to develop and adopt a pavement management program as a condition of state grant eligibility (California Streets and Highway Code, Section 2108.1). The program requires the City to maintain an inventory of City streets and identify sections needing rehabilitation or replacement and the associated budget. MTC assists cities through a Pavement Technical Assistance Program (PTAP), which provides grants to fund detailed condition distress surveys that must be conducted every two years. These surveys are based on the Pavement Condition Index (PCI) which uses a rating system of 0-100 to give an overall indication of the pavement condition. A summary of the rating system is shown in the table below:

Table 1 – Pavement Condition Classification

PCI Range	Pavement Condition Class
70-100	Good (I) Shows slight or moderate distress requiring mostly preventative, life extending maintenance
60-69	Fair (II) Worn to the point where minor rehabilitation is necessary
50-59	At-Risk (III) Worn to the point where the pavement surface requires major rehabilitation or reconstruction
25-49	Poor (IV) Pavement surface has failed and requires reconstruction
0-24	Failed (V) Pavement and sub-base have failed and require reconstruction

The City received a PTAP grant to fund a pavement condition survey that was performed in late 2014. The results of this survey are documented in the attached Pavement Management Program Budget Options Report by Capitol Asset & Pavement Services, Inc. (Attachment A). The information presented here is based on this Budget Options Report.

Analysis

Existing Pavement Condition

The pavement condition survey conducted in late 2014 indicates that the overall average PCI of the City's street network is 56. This rating corresponds to a pavement condition classification of "At-Risk". This rating places the City of Belmont's street network as the lowest rated in San Mateo County (20th of 20 jurisdictions, see Attachment B), and toward the bottom in the San Francisco Bay Area (101st of 109 jurisdictions), based on MTC's 2014 PCI report for Bay Area Cities and Counties.

Table 2 – Street Statistics and Average PCI by Functional Class

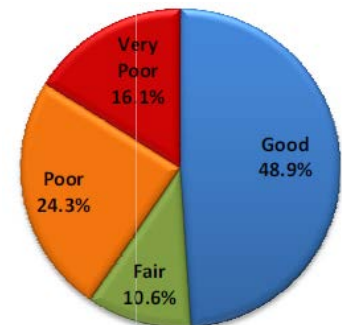
Functional Class	% of Network (by Area)	Average PCI
Arterial	10.4%	67
Collector	32.1%	60
Residential	57.5%	52
Overall Average PCI		56

Streets are broken into three categories: *Arterial*, *Collector* and *Residential*. *Arterial Streets* are high capacity urban roads that connect to freeways and urban centers. *Collector Streets* are low to moderate capacity streets that move traffic from residential areas to Arterial Streets. The third category of streets is *Residential*.

Table 3 lists the condition of the street network by each condition class. The condition of individual streets within the network varies greatly with 48.9% of the area network falling into the "Good" classification and 16.1% of the area network falling into the "Very Poor" classification.

Table 3 – Percent Network Area by Functional Class and Condition Class

Condition Class	PCI Range	Arterial	Collector	Residential	Total
Good	70-100	6.8%	15.8%	26.4%	48.9%
Fair	50-69	1.0%	5.7%	3.9%	10.6%
Poor	25-49	1.5%	7.6%	15.3%	24.3%
Very Poor	0-24	1.2%	3.1%	11.8%	16.1%
Totals		10.4%	32.9%	56.7%	100%



The 48.9% of the street network that falls into the "Good" category can benefit from minor treatments that correct minor faults and prolong the life of the pavement. The 10.6% of the street network that falls in the "Fair" condition shows some form of distress. These streets are at or near the point where the deterioration rate accelerates if left untreated. The remaining 30.4% of the network that fall in to the "Poor" or "Very Poor" are at or near the end of their service life.

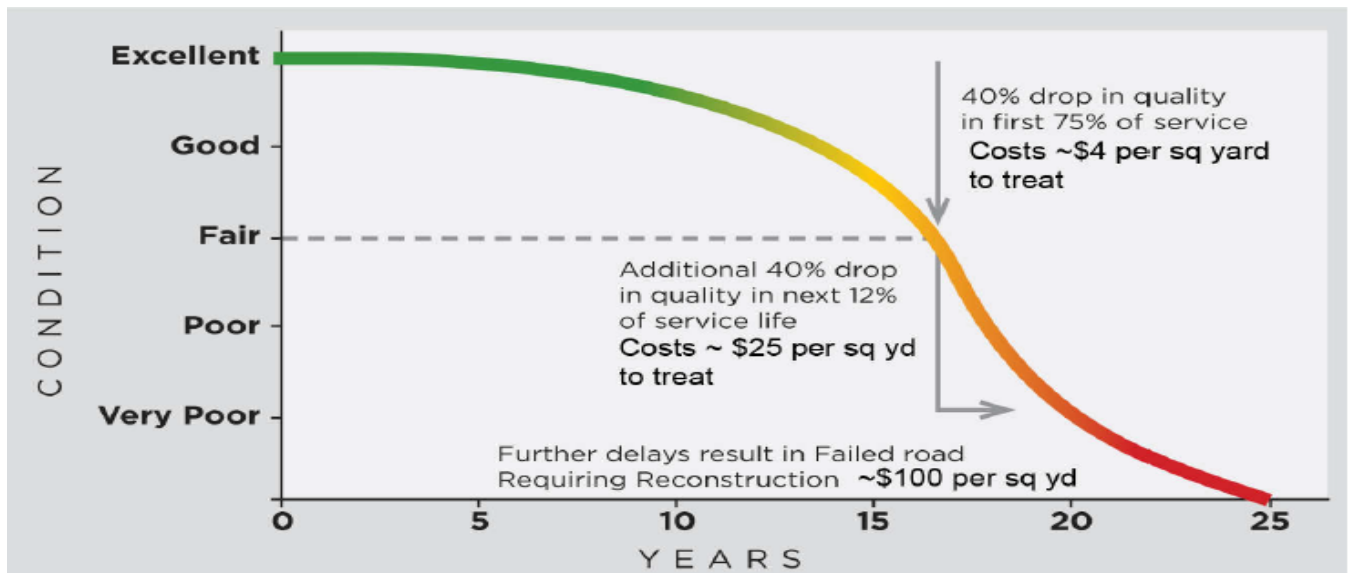
As more of the "Good" streets deteriorate into the "Fair" or "Poor" condition, the cost to maintain them will increase. Table 4 shows the variance in a range of pavement treatment cost in the different condition categories.

Table 4 – Estimated Pavement Treatment Costs and Condition Class

Condition Class	Typical Treatment	Range of Treatment Cost
Good	Crack sealing, slurry seal	less than \$4.00 /sq. yd.
Fair	Slurry seal with dugouts, mill and thin overlay	\$4.00-\$25.0/sq. yd.
Poor, Very Poor	Mill and thick overlay, pavement reconstruction	\$30.00-\$136.00/sq. yd.

Figure 1 depicts condition deterioration curve and treatment cost over the life cycle of a street.

Figure 1 – Street Condition over time



Pavement Management Program Budget Options

Based on existing revenues, on average the City invests approximately \$360,000 a year on pavement preservation, rehabilitation and reconstruction. This does not include other street related work such as drainage, sidewalks, retaining walls, street lights, traffic signals, signs, etc. At this rate of investment, it is estimated that in 5 years, the overall network PCI will decrease by 10 points from 56 to 46 with the percentage of the street network in the “Very Poor” condition increasing from 16.1% to 30.8%. The percentage of the street network in “Good” condition is also expected to decrease from 48.9% to 45.4%.

The results of the pavement condition survey were entered into MTC’s Streetsaver Pavement Management Program (PMP) to develop a maintenance strategy to improve the overall condition of the street network. The Streetsaver program models a multi-year maintenance plan with the most cost effective repairs for various funding levels and timelines.

Two major changes to note in the MTC Streetsaver program from the previous 2012 assessment report which has resulted is a reduction in costs to bring the City’s network into “optimal” status:

1. The MTC Streetsaver “optimal” target was reduced from a PCI of 84 in 2012 to a PCI of 82 in 2014.
2. The costs used on pavement treatment was reduced based on a region wide survey conducted by MTC which indicated that the average treatment costs have declined over the last few years due to price of oil, and lower construction cost.

The “Pavement Management Program Budget Options Report” includes the following scenarios which were run for five year periods with the two noted changes above. The results are summarized in Table 5 below.

1. Unconstrained (zero “deferred maintenance”) – This scenario indicates that \$38.1 million would be needed to reach an overall average network PCI of 82 (as currently recommended by MTC) within 5 years.
2. Current Investment Level – This scenario shows the effect of the City’s current budget level which would likely result in a PCI of 50 by 2019.
3. Maintain Existing PCI – This scenario indicates that an annual funding level of \$1.2 million for a total of \$6.0 million would be required to maintain the current average PCI of 56 over a 5 year period.
4. Increase PCI by 5 Points – this scenario indicates that an annual funding level of \$2.1 million for a total of \$10.5 million would be required to increase the average network PCI to 61 by 2019.

Table 5 – Scenario Summary

Scenario Name	5 Year Budget	2019 PCI (change)	2019 Deferred Maintenance	2019 % Good	2019 %Very Poor
1 – Unconstrained	\$38.1 million	82 (+26)	\$0	94.2%	0.0%
2 – Current Investment	\$1.8 million	50 (-6)	\$36.3 million	45.4%	30.8%
3 – Maintain Current PCI	\$6.0 million	56 (+0)	\$34.0 million	61.5%	30.8%
4 – Increase PCI 5 points	\$10.5 million	61 (+5)	\$29.5 million	67.0%	26.7%

Pavement Management

The City has been following the preferred cost effective strategy of using majority of its funding on less expensive treatments to keep “Good” streets from declining into the “Fair” and “At-Risk” condition. Table 6 shows the results of this strategy by comparing the results of the 2012 pavement condition survey with the survey completed at the end of 2014.

Table 6 – Pavement Condition Summary

Functional Class	Average PCI 2010	Average PCI 2012	Average PCI 2014
Arterial	70	76	67
Collector	62	60	60
Residential	54	51	52
<i>Overall Average</i>	<i>58</i>	<i>57</i>	<i>56</i>

After reviewing the survey results of 2012, the Department implemented an aggressive pavement crack sealing and patching program. The result was an increase of one (1) point in the residential portion of the street network.

The City’s preventative maintenance program kept the collector portion of the street program at PCI of 60. In contrast, the street network experienced a decline of nine (9) PCI points in the arterial portion of the street network.

As mentioned above the poorer the condition of the pavement, the higher the treatment costs. Given the existing funding limitations, the Public Works Department continues to provide best management approaches in providing maximum pavement preservation which involves the following elements:

1. Continue the aggressive pavement crack sealing and patching program. Water intrusion is a major destructive element to pavements. Crack sealing is a relatively inexpensive treatment that prevents water from further damaging streets. Filling or sealing pavement cracks can extend the life of a pavement by three to five years at a minimum.
2. Targeting maintenance of streets in the “At-Risk” condition. In addition to keeping streets in good condition from deteriorating, attention will be given to the extent possible to prevent streets from sub-base failure which can significantly increase the cost of repairs.
3. Where applicable exploring alternative, and lower cost treatments for pavements in “Poor” condition. The City has been treating streets in “Poor” condition by grinding and applying thick overlays treatments which can cost upwards of \$30/square yard, which is a cheaper alternative than needed reconstruction, although it will not last as long.
4. Coordinating utility improvements to minimize impacts to pavement. This will entail developing a 5 year list of street candidates for treatment in order to better coordinate work with other city utility reconstruction efforts, and external utility agencies.

In addition to the above practices during the assessment it was noted that the surface condition of utility patches were in much poorer condition than the rest of the street surface. Utility trenches have an overall negative impact on the life-cycle of rehabilitation treatments. The implementation of a street preservation ordinance was recommended in the report. This item will be brought back for council consideration at a later date.

In light of the substantial financial commitment that is required to maintain and improve City wide road conditions, and the potential increase in construction and raw material costs, it is relevant to discuss the various possible financing alternatives to help fund pavement rehabilitation and preventive maintenance for the City. City Council and community support is needed in considering additional revenue sources to fund needed rehabilitation and maintenance of the City streets. In addition, staff will continue to seek and apply for grants to augment the City's funding for street improvements. Arterial and Collector Streets are designated as FAU, or "Federal Aid Urban" streets, and federal funding or certain state funding may only be used on those streets, when available. However, typically there aren't many grant funding opportunities for the Residential Streets.

Alternatives

1. None

Attachments

- A. Pavement Management Program Budget Report, April 2014
- B. 2014 PCI scores for each San Mateo County Jurisdiction

Fiscal Impact

- ☒ No Impact/Not Applicable
☐ Funding Source Confirmed:

Source:

- ☐ Council
☒ Staff
☐ Citizen Initiated
☐ Other*

Purpose:

- ☐ Statutory/Contractual Requirement
☒ Council Vision/Priority
☐ Discretionary Action
☐ Plan Implementation*

Public Outreach:

- ☒ Posting of Agenda
☐ Other*

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